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AUTHOR Humes, Ann
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ABSTRACT

Following a discussion of the general requirements for a vocabulary development program, this paper presents an instructional design for vocabulary development. The five sections of the design that are discussed include (1) vocabulary from context; (2) word structure; (3) roots, affixes, and affixation processes; (4) alternative language; and (5) subject area vocabulary. Appendixes contain further details of the instructional content for these five sections. (RL)

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A DESIGN FOR A VOCABULARY DEVELOPMENT PROGRAM

Ann Humes

ABSTRACT

The general requirements for a vocabulary development program are discussed. Then a design for a vocabulary development program is presented and exemplified. This design is based on a previously documented review of the literature in the area of vocabulary development.

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A DESIGN FOR A VOCABULARY DEVELOPMENT PROGRAM

Ann Humes

An earlier paper (Humes, 1976) presented the findings of a review of the literature in the area of vocabulary development. The review confirmed the importance of vocabulary development for success in language-related activities. The review also determined that most of the valid information on vocabulary development technology remains in the domain of research and that available materials are generally haphazard in organization, sequencing, and presentation. Thus there appears to be a need for a discrete, research-based program with well-designed teacher and student materials that can be readily implemented in the classroom.

It was determined that (1) vocabulary development is the process of acquiring vocabulary skills and knowledge, irretrievably intertwined with the acquisition of the concepts for which the words are labels and (2) vocabulary development technology consists of the procedures employed to facilitate vocabulary development processes. It was con-concluded that a variety of techniques are appropriate for vocabulary development instruction: teaching vocabulary concepts, teaching categories of vocabulary terms, and teaching vocabulary encoding and decoding skills. ("Encoding" refers here to generating communications--word parts, words, groups of words--from knowledge of meaning. "Decoding" refers to analyzing a word--or a group of words--in isolation or within its environment to determine meaning.) It was also concluded that the categorization/classification model, as described by O'Rourke (1974), provides viable guidelines for organizing content for presentation.

The review elicited a wide range of content promulgated for inclusion in a vocabulary development program. (Specific content suggested by two or more authorities is summarized in Table 1.)

This paper has two purposes. One purpose is to discuss the general requirements for a vocabulary development program: (1) instruction should be explicit; (2) it should accommodate acquiring precision of meaning and breadth of word usage in both the receptive and productive modes of language; (3) it should facilitate technological variety; (4) it should have a sound linguistic basis. The second purpose of this paper is to present a proposed design for a vocabulary development program, which is based on the information provided by the literature review documented in Humes (1976). Descriptions of instructional techniques (e.g., vocabulary-concept teaching methods) which appear in that paper are not repeated here.

GENERAL REQUIREMENTS FOR A VOCABULARY DEVELOPMENT PROGRAM

It is proposed that the techniques for developing vocabulary should be taught explicitly rather than incidentally because considerable evidence dispels the idea that copious reading composes a sufficient methodology for promoting vocabulary development (Petty, Herold, and Stoll, 1967). A study by Gray and Holmes (1938) confirms the superiority of explicit instruction over incidental learning. Gray and Holmes worked with fourth-grade students at the University of Chicago laboratory schools. Their control group consisted of 21 students who received only incidental vocabulary instruction. Two comparably sized experimental groups received explicit vocabulary instruction. The

experimental groups evidenced a much greater gain in vocabulary knowledge, and Holmes and Gray concluded that students will acquire few new vocabulary terms from encountering many words in reading unless they are explicitly guided in doing so. Block (1976) also supports explicit vocabulary instruction, referring, as supportive evidence, to a program in which explicit instruction on vocabulary terms in social science produced superior performances in both silent and oral reading for fourth-grade students.

In addition to providing for explicit instruction, the design for a vocabulary development program accommodates acquiring precision of word meaning and breadth of word usage. Dunkel (1944) concluded from his experimental study of word meaning that making precise distinctions is difficult and that students need elementary training to achieve such competence. Khan (1972) found that specificity of meaning can result from vocabulary instruction.

Cronbach (1942) includes these criteria when he posits five categories of understanding word meaning: (1) generalization--the child can define the word; (2) application--the child can recognize an appropriate illustration of the word; (3) breadth of meaning--the child can recall different meanings for a word and knows when its use is appropriate for a particular context; (4) precision--the child can apply the term correctly in all possible situations, even unfamiliar ones; (5) availability--the child can use the term in thinking and in discourse.

To assure such breadth and precision as Cronbach's five categories assume, students' vocabulary competence must be manifest in both the

receptive modes of reading and listening and the productive modes of speaking and writing. This requirement is corroborated by Petty et al. (1967), who, after their survey of the state of knowledge about vocabulary, concluded that there is verifiable evidence that students may understand the words they read or hear and yet not be able to use them in writing or speaking. Anderson (1972; also Anderson and Kulhavy, 1972) advocates utilizing the productive modes of language in instruction. His position is supported by the results of a study in which college students who learned vocabulary words through instructional procedures requiring semantic encoding performed better on subsequent tests that did students learning through instructional procedures that operated within the receptive modes.

A design for a vocabulary development program can facilitate using a variety of technology and content to maximize the range of the program's utility. This conclusion is predicated on the advice of such authorities as the members of NIE's Conference on Reading Studies (1975). The members of that conference admonish developers of materials that a single text is unlikely to satisfy all vocabulary requirements. To achieve maximum utility, the design proposed here is divided into five independent sections. This division facilitates applying a range of instructional techniques to a variety of content.

Studies corroborate the importance of instructional variety in promoting vocabulary development. Mayer and Grenno (1972) conducted a study in which two different methods were used to teach students the concept of binomial probability. The instruction for one group

emphasized mechanical calculating techniques. Instruction for the other group emphasized meanings of the variables in the formula. When the two methods produced structurally different learning outcomes, the experimenters concluded that a combination of methods would best accommodate students' needs.

Draper and Moeller (1971) achieved "overwhelming" results from a program that utilized a variety of techniques: (1) explaining the meaning of the words; (2) illustrating its uses; (3) describing structural features and grammatical forms; (4) noting synonyms and antonyms; (5) using the word in context. Johnson and Stratton (1966) also confirmed the superiority of technological variety. They constructed materials to teach five separate experimental groups. One group was taught by definition, a second group by sentence completion, a third group by classifying items, a fourth group by synonyms. A fifth group attained the highest total score on the subsequent testing; that group received instruction combining the methods used with groups one through four.

The instructional variety facilitated by the proposed design's sectional division of the content concomitantly attains decontextualization of the content. Block (1976) stresses the importance of decontextualization and regrets that it is not being done systematically by any currently available program. Decontextualization occurs when a word is taught by a number of techniques and appears in several instructional settings; then it does not acquire, in the student's mind, only that usage meaning applicable in a single presentation.

The content of a vocabulary development program should be based on valid linguistic information. The importance of this linguistic basis is substantiated by Petty et al. (1967), who decry the lack of a sound linguistic basis in most vocabulary development programs. The proposed design incorporates the principles affirmed by modern linguistic research. Furthermore, the examplars of that content will be current: Individual items of content are to be selected from SWRL's recently compiled and verified communication skills lexicon (Rhode and Cronnell, forthcoming). This lexicon consists of a large and unexploited data base of linguistically valid content that can be readily incorporated into a vocabulary development program.

A DESIGN FOR A VOCABULARY DEVELOPMENT PROGRAM*

Content suggested by two or more authorities is summarized in Table 1. Some of the content suggested by the literature review has been eliminated from the design. Productivity was the criterion for exclusion. However, the content and organization of the design are tentative and flexible, and they are subject to revision on the basis of subsequent research.

Each section of the design can accommodate instruction and practice in the use of resources such as dictionaries, synonym dictionaries, and thesauri. The five sections of the design for a vocabulary development program are (1) Vocabulary from Context, (2) Word Structure, (3) Roots, Affixes, and Affixation Processes, (4) Alternative Language, and (5) Subject-Area Vocabulary (see Table 2).

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*Bruce Cronnell contributed to the organization of this design.

Table 1

Suggestions for Vocabulary Development Program Content

Contextual clues
Compounds
Word structure
Homonyms, synonyms, antonyms
Denotation and connotation
Rhyming words
Etymology
Origins of names
Adjectives from proper nouns
Morpheme study
Pronunciation
Syllabication
Malaprops
Spoonerisms
Dictionary usage
Color words
Multiple meaning words
Contractions
Clipped words
Acronyms
Figurative language: simile, personification, metaphor, hyperbole, metonymy, synecdoche, litotes, allegory, oxymoron, analogies
Portmanteau words
Slang
Allusions
Onomatopoeia
Euphemisms
Imagery
Affective language
Capitalization
Plurals
Punctuation

Table 2

Content of the Vocabulary Development Design

VOCABULARY FROM CONTEXT

Objective Definitions
- Direct explanation
- Appositive
- Synonym and antonym
- Example
- Classification
- Description

Organizational Aids
- Modifiers - Adverbs
- Modifiers - Adjectives
- Relative pronouns
- Conjunctions
- Appositives
- Groupings
- Parallel construction
- Repetition
- Typography
  - Headings
  - Punctuation
  - Parentheses

Semantic Aids
- Comparison/Contrast
- Cause/Effect
- Restatement
- Modifiers - Adverbs
- Figurative language
  - Similes
  - Metaphors
  - Analogy
- Affective language
  - Connotation
  - Imagery

WORD STRUCTURE

- Spelling-to-sound decoding
- Affixed words
- Number
- Capitalization
- Compounds
- Abbreviations
- Possessives
- Contractions

ROOTS, AFFIXES, AND AFFIXATION PROCESSES

- Prefixes
- Suffixes
- Roots
- Affixation Processes

ALTERNATIVE LANGUAGE

Synonymous Language
- Synonyms
- Terms of specificity

Affective Language
- Connotative language
- Imagery
- Euphemisms
- Sexist language

Figurative Language
- Hyperbole
- Personification
- Oxymoron
- Synecdoche and metonomy
- Simile
- Metaphor
- Analogy
- Idiomatic language

Confusing Language
- Multiple meanings
- Homophones
- Homographs
- Adjectives and adverbs of relativity
- Visually confusing words
- Language that varies with time and space

SUBJECT-AREA VOCABULARY

- Math
- Science
- Art
- Music
- Social Science
- Communication Skills

The classification theory for categorizing supraordinate and subordinate vocabulary concepts (O'Rourke, 1974) was used as a model for organizing all sections of the design. Each section is discussed below and then described in detail in the appendices.

VOCABULARY FROM CONTEXT

A vocabulary development program should include explicit instruction on those aspects of a word's contextual environment that may proffer clues to a word's meaning. Students encounter many words in reading that are not explicitly taught. Accoutered with knowledge of syntactic and semantic keys to meaning, students can extract a measure of meaning from context so they need not interrupt a reading episode to check a dictionary.

Clues to meaning can be derived from such components of context as objective definitions (e.g., appositives), organizational aids (e.g., parallel construction), and semantic aids (e.g., comparison and contrast). However, the connection between an unfamiliar word and its context must be clearly evident (Deighton, 1959). Form classes are to be carefully considered in selecting content items, since form class seems to be a significant factor in correctly identifying words from context (Quealy, 1969).

The instruction for Vocabulary from Context can incorporate technology for teaching decoding skills. Techniques should focus on learning such skills rather than on acquiring knowledge of a specific word or group of words (Morrison, 1976).

Exemplified content for Vocabulary from Context is detailed in Appendix A.

WORD STRUCTURE

This section of the design for a vocabulary development program focuses on the individual word in isolation. It is predicated on the principle that the internal structure of words may frequently be used to determine the meaning of words encountered in reading and, less commonly, in listening. This component of the vocabulary development technology ignores a word's contextual environment and focuses on the isolated word itself.

The utility of a word's structure for decoding meaning depends in part on previous knowledge of words. A word known orally may be comprehended in reading if it can be translated into speech. Partial meanings of affixed and compound words may be grasped if known root words or component words within them can be recognized. Contractions and abbreviations may also be comprehended if the full form is known and can be determined.

Punctuation within a word may provide clues to meaning. A capital letter indicates a proper name; 's or s' indicates a possessive noun. While the rest of the word may not be understood, this partial semantic information can assist comprehension.

By employing such previous knowledge of words, the reader or listener can obtain clues to meaning. (New knowledge of words and word parts is treated in separate sections. Thus the meaning of new affixes is treated not under Word Structure, but in the section on Roots, Affixes, and Affixation Processes.)

The technology of the Word Structure section develops vocabulary decoding skills. These skills should be taught in such a way that students learn application principles rather than discrete facts (Morrison, 1976; O'Rourke, 1974).

Details of the Word Structure section are described in Appendix B.

ROOTS, AFFIXES, AND AFFIXATION PROCESSES

An important section of the design for a vocabulary development program teaches knowledge of the meaning of affixes and roots and of the processes for combining the word parts. This knowledge frequently provides clues to the meaning of an unfamiliar term. It also facilitates generating new words. Additionally, suffixes generally indicate the part of speech, limiting the range of possible meaning. Thus recognizing this function of a suffix is utilitarian. Providing instruction and practice on the meaning and use of productive affixes and roots facilitates vocabulary development.

Sometimes graphemic and phonemic changes are effected through processes such as consonant doubling, e-dropping, y changing to i, assimilation, and pronunciation change. Understanding these processes assists students in decoding the elements of a word so they may apply their knowledge of root and affix meaning. Knowledge of these processes also increases students' ability to construct, for both speech and writing, new words that label concepts they have learned.

Technology for instruction on roots, affixes, and affixation processes includes teaching vocabulary decoding skills: Words can be

decoded by analyzing their component morphemes. Technology also incorporates teaching encoding skills. Students can be taught to encode words from their knowledge of morpheme meaning, of the function of the affixes, and of the processes involved in affixation. Instruction should inform students that some word parts may have more than one meaning (Ayers, 1965; Deighton, 1959; O'Rourke, 1974; Thorndike, 1941). Additionally, techniques for teaching vocabulary classifications can be employed (e.g., words with the same root are categorized and presented together).

Specific content of Roots, Affixes, and Affixation Processes is discussed in Appendix C.

ALTERNATIVE LANGUAGE

Vocabulary development includes learning to recognize, comprehend, and produce alternative ways of communicating a word, an image, a concept. Well-designed and implemented instruction on such language alternatives can increase the effectiveness of students' communication skills because their vocabulary usage becomes more appropriate, precise, descriptive, and interesting.

The purpose of the Alternative Language section of the design is to effect this competence in vocabulary alternatives. It provides for both the recognition and production of alternative language. The subdivisions of Alternative Language are synonymous language, affective language, figurative language, and confusing language.

The subsection on synonymous language provides for learning appropriate synonyms for high-frequency words. It concomitantly teaches understanding and producing antonyms.

The subsection dealing with affective language emphasizes recognition of language that creates an emotional response because of its connotation, imagery, or sexism, as well as awareness of language that avoids emotional responses, i.e., euphemisms. Instruction can enable students to produce their own affective alternatives through the conscious choice of appropriate vocabulary. Instruction can also teach students how to use alternative language that avoids sexism and its concomitant negative emotional responses.

Figurative language may be dramatic and interesting as alternative vocabulary. Instruction can focus on both recognizing and creating effective figures of speech.

Confusing language is the final subsection of Alternative Language. This subsection is comprised of instruction on the use of words with multiple meanings as well as instruction on recognizing and avoiding the production of words that are visually, orally, or conceptually confusing.

Technology for Alternative Language includes teaching vocabulary decoding and encoding skills (as defined earlier). Decoding skills are particularly important for understanding the meaning of figures of speech. Encoding skills are necessary for generating any form of alternative language. Techniques used in concept-learning methodology are especially helpful in teaching knowledge of adjectives and adverbs

of relativity (Carroll, 1964). The techniques for teaching supra-ordinate and subordinate classifications of concepts are viable for instruction on synonymous language and terms of specificity.

Content for each subsection of Alternative Language is specified in Appendix D.

SUBJECT-AREA VOCABULARY

Although technical vocabulary is usually treated solely within the instructional domain of the particular subject area, if it is taught at all, subject-area vocabulary is an independent section of this design. Prolific vocabulary development is essential for subject-area study: Students are expected to acquire a working vocabulary of terms that become prerequisite to learning new concepts in subsequent instruction. For example, in math a student must know a previously taught vocabulary concept like angle in order to understand subsequent instruction in geometry that assumes knowledge of that term.

Students frequently do not have the important working knowledge of technical, concept-building terminology that teachers and textbooks may assume they possess. Consequently, instruction designed to provide explicit knowledge of and experience with subject-area terminology can eliminate some of the language barriers to future learning.

Vocabulary development instruction does not embrace teaching the subject areas themselves; e.g., vocabulary instruction for math terms does not teach students how to estimate; rather, it teaches the term estimate as a vocabulary concept.

The subject-area vocabulary in this design encompasses terms from these disciplines: math, science, art, music, social science, and communication skills. These subject areas are further divided into subcategories as well as into varying levels of difficulty. Some of the content is incorporated into other sections of the design to assure treatment with a variety of instructional techniques.

Vocabulary concept-learning techniques should be employed in teaching subject-area vocabulary (Russell, 1954). The techniques should conform to the criteria stipulated by authorities in the field of vocabulary concept learning such as Carroll (1964), Clark (1971), Klausmeier, Ghatala, and Frayer (1974), and Markle (1975). Additionally, techniques for teaching classifications of a vocabulary concept, as delineated by O'Rourke (1974), can be employed for subject-area terms that have organizational similarities within the subject area in which they are taught (e.g., organization by morphemes within math, such as the term meter as it is used in diameter, perimeter, etc.).

Appendix E contains details of the content for Subject-Area Vocabulary, which is subject to revision with further refinement of the vocabulary concepts and the classifications of the concepts.

APPENDIX A

VOCABULARY FROM CONTEXT

OBJECTIVE DEFINITIONS

Direct explanation

This context reads like a simplified dictionary entry in that it explicitly defines terms. Direct explanation is characteristic of textbook material. It may entail a sentence, several sentences, or an entire paragraph.

Examples*

1. By listening vocabulary is meant all the words a person knows well. The words are understood when someone else uses them.

2. The nucleus is the center of an atom.

Appositive

An appositive is a word, phrase, or clause that is set off by commas immediately after the unknown term. The appositive identifies or defines that term.

Examples

1. The natives believed that demons, or evil spirits, lived beyond the river.

2. The minutes, a written record of the meeting, were kept by the secretary.

3. Etymology, language study dealing with word orgins, ought to be viewed as one way to help children with word meanings.

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*Terms defined by context are underlined in the examples.

Synonym and antonym

A synonym is a word embodying nearly the same meaning as the target word. Often the real difference is in connotation. This difference is an important point to be considered in instruction.

Examples

1. The man is very old. He is senile.
2. If I were ambidextrous, I could use both hands equally well.
3. The truck came to an abrupt halt; it stopped suddenly.

An antonym tells a reader what a word is not.

Examples

1. There is a greater difference between the tumult on the outside and the peace inside.
2. I wonder whether the money will be a blessing or a bane.
3. Sue and Mary were eager to leave, but their brother was reluctant.

Example

An example "definition" is an instance of the unknown term. Defining by example is somewhat like defining a class by naming one of the members of that class; it is almost a reverse of the classic definition process of classifying and differentiating. Frequently a single word or phrase will indicate that an example follows. Some of the signals are "such as," "such," "like," "especially," "for example," "other," "this," and "these."

Examples

1. Narrative poems are poems such as "Paul Revere's Ride" and "The Rime of the Ancient Mariner."

2. The letter pair "un" is a common prefix in our language, as in "unhappy," "undo," and "untie."

3. Joan was a selfish child. For instance, she would not let any others play with her toys or look at her books.

Classification

Classification brings like things together under one heading: Fire truck, automobile, and bicycle can be classified under the larger heading of vehicles. A classifying word, phrase, or clause can contribute some of the meaning of an unfamiliar term if students are familiar with either the class itself or with one or more of the members of that class.

Examples (The defining classifier is parenthesized.)

1. Look at the poinsettias when you are in the (garden).

2. A computer is (electronic).

3. The technique of casting, (which every fisherman learns to master), seemed difficult to the boy.

Description

This form of definition is effected through details about physical characteristics and/or purposes of the unfamiliar term. A descriptive definition tells how something looks, where it is found, what its size is, how it is used, etc.

Examples

1. A firetruck has ladders and hoses on it, and it is usually very large and painted red.

2. A kettle is deep and has a handle. The handle goes over the top from one side to the other. A kettle is used for heating and boiling liquids.

3. ...they flew over the desert. It was very dry because a desert doesn't get much rain. There were no rivers or creeks. The soil looked like dry dust and sand.

ORGANIZATIONAL AIDS

Use of the subsequent organizational aids may require other skills detailed in other sections of Vocabulary from Context.

Modifiers - Adverbs

An adverbial modifier may be a word, a phrase, or a clause that provides information about a verb, an adjective, another adverb, or an entire sentence. Adverbial modifiers that positionally predict that subsequent constructions will help explain a previously unfamiliar term include "also," "thus," "accordingly," "besides," "consequently," "hence," "however," "indeed," "namely," "nevertheless," "so," "on the other hand," "additionally," etc. A student can learn to examine the organization of a sentence for such modifiers.

Examples

1. The whole crowd then had some nachos. (In addition,) they ate rice.

2. The mountain climbers were exhausted. (Nevertheless,) their joy at reaching the top gave them new energy.

Relative pronouns

Relative pronouns "rename" the term that is their antecedent, the term to which they refer. They are used in a special class of adjective modifiers: The relative pronoun is part of an adjective clause. The word itself signals the reader that it "substitutes" for the unfamiliar antecedent and is part of a group of words that may clarify the

unfamiliar term. These pronouns include "who," "which," "what," "that," "whose," and their compound forms with "ever" (e.g., "whoever"). The clause that follows the relative pronoun incorporates other kinds of contextual clues.

Examples

1. All of you have nervous systems (that) carry messages to and from various parts of your body.
2. The ecologists, (who) were seeking clean air and water, started a letter writing campaign.

Appositives

The position of the appositive in the sentence (with the comma punctuation that sets it off) is an organizational aid for deriving meaning through context. See appositives under Objective Definitions above.

Conjunctions

Conjunctions are words that establish connections. They join elements of the sentence. The coordinating conjunctions are "and," "but," "for," "nor," "or" ("yet" is included by some authorities). A conjunction clues readers that some of the information following it is related to the unfamiliar term and so may help clarify it. This is particularly possible if the conjunction infers either causation ("for"), negation ("but," "nor"), or alternative ("or").

Example

1. We had expected to debark by noon, (but) the train was late.

2. The sky seems more gloomy than ever, (for) we were feeling sad ourselves.

3. The man didn't know whether to buy the Mackinaw, (or) whether another kind of coat would be better.

Groupings

A general classification of an unfamiliar word can be deduced if the word appears in a series of members of that class. The usual organizational unit is a comma series.

Examples

1. She produced many different kinds of things—poems, essays, plays, and short stories.

2. I went shopping for bread, meat, tomatoes, and yams.

3. The wallpaper was so funny that I can only remember seeing yellow, aqua, and black.

Parallel construction

Parallel construction establishes a connection between the target term and language that can help identify that term by the repetition of a syntactic pattern. The syntactic pattern may entail a repeated phrase, clause, or entire sentence. A word or words in a particular position in one representative of the parallelism may clarify an unfamiliar term in the same position in another representative.

Examples

1. Nobility of character manifests itself in small ways. Sarah Smith's (showed) itself today in flaky dishes of pastry.

2. Dialogue can be easily overdone. Do not use it for trivialities; do not let it become (mere patter). Do not use it for (unimportant meetings of the characters).

3. With morning we saw that the sky was overcast, that everything was (gray) except our yellow raft.

Repetition (of words, phrases)

The repetition of key words and phrases (not the syntactic patterns of parallel construction) establishes an inferential connection between the unfamiliar word and the explanatory context.

Example

A surface is smooth when it is free from roughness, like the surface of glass. A painted surface can be polished. A surface will not be even if it is warped from being exposed to the weather.

Typography

1. Headings. Major headings may help determine the meaning of a subheading which contains an unfamiliar word. For example, the major heading "Furniture You Can Make" will help classify an ottoman as a piece of furniture. Paragraph headings may also function in this way for terms within the paragraph.
2. Punctuation. Dashes often indicate that explanatory information follows: The girls were contrite--they were sorry they had misbehaved. Colons may serve this same function. Commas may indicate an appositional definition or the interjection of a modifier.
3. Parentheses. Parentheses often indicate that explanatory information is being inserted in the sentence, that the information is necessary for comprehension, but cannot be worked appropriately into the sentence itself: The boys were excited about the kaftans (clothes very important to them), and they put them on immediately.

SEMANTIC AIDS

Comparison and contrast

Comparison and contrast define by telling what something is like and what it is not like. For lucid instruction, no more than two entities should be compared. Unfamiliar terms may be defined by sentences or passages that compare the target word with and/or contrast it to familiar objects, places, people, groups, or ideas.

Example

1. Narrative poems are not like poems describing lovely scenes. They are not short like nursery rhymes or short jingles that tell a single joke. Narrative poems are like short stories, with action and plot and a climax. Unlike short stories, they frequently rhyme.

Each of the sentences in this passage may serve by itself as an instance of comparison or contrast.

Cause-effect

An unfamiliar word in a statement of cause may be partially clarified by the resulting effect. This process also works in reverse, with the statement of cause clarifying a term in the statement of effect.

Examples

1. On April 6, the President told the Governor that provisions would soon reach the troops. On April 12, the troops ate their first good meal in a month.

2. If you leave the pan on the fire too long, the food will be scorched.

Restatement

Restatement is the repetition of a thought in different words. The new statement may clarify the meaning of unfamiliar terms in the first statement.

Example

1. His consecutive games record went on and on. Sick or well, he never missed a game.

Sometimes the restatement renders an antonymous meaning.

Example

1. The behaviorist movement caused people to believe that nearly all human traits are conditioned. The behaviorists were suspicious of any evidence that people's differences are inherited.

Modifiers - Adverbs

An adverbial modifier (a word, a phrase, or a clause) may provide some semantic information about an unfamiliar verb, adjective, or another adverb.

Examples

1. They (slowly) trudged (up the side of the mountain).
2. They trudged (up the side of the mountain) (like weary soldiers).
3. They trudged (up the side of the mountain) (as if the world were on their shoulders).

Figurative language

Figures of speech may be included in the instructional design if they prove productive and feasible. Similes and metaphors are comparisons, so they may provide information similar to that derived from comparison and contrast, as described above. Analogy may also be productive, since it is an extended metaphor. For an explanation of figurative language, see Appendix D.

Affective language

Affective language may also be included in the instructional design if it proves productive and feasible. Affective language such as connotative terms and imagery may provide some clues to the emotional tone that accompanies an unfamiliar term. For an explanation of affective language, see Appendix D.

APPENDIX B

WORD STRUCTURE

SPELLING-TO-SOUND DECODING

A word may be in a person's speaking vocabulary, but not in his or her reading vocabulary. Thus pronouncing a word may provide sufficient identification for comprehension. For example, a person may know the meaning of /kyūkəmbər/, but may never have seen cucumber in print; simply decoding cucumber as /kyūkəmbər/ can indicate the meaning of the word.

AFFIXED WORDS

Affixed (prefixed and/or suffixed) words may not be known by the reader as units, although the root word may be known; e.g., fishery may be an unfamiliar word, although fish would be familiar. Recognition of the known root word within the unknown affixed word may help to establish a meaning base for comprehension; e.g., fishery must mean something about fish. Unless the meaning of the affix is known, it will not provide any information. (Affix meaning is treated in a separate section of the vocabulary development design; see Appendix G.)

Common spelling changes occur when a suffix beginning with a vowel is added to a root word. Recognition of these grapheme occurrences can help identify a root word that may be familiar. For details on spelling and pronunciation changes resulting from affixation, see Appendix C.

NUMBER

Knowledge of singular and plural forms can be used to derive some meaning for a word. Singular is the unmarked form, while plural is generally marked by the addition of the -s or -es suffix. Other plurals exist, such as vowel alternation (e.g., foot-feet) and Greek and Latin forms.

CAPITALIZATION

Capitalization can clue meaning because it marks proper nouns as distinct from common nouns. This is particularly true for semantically distinct proper and common noun usage (e.g., March-march).

COMPOUNDS

Noting the components of compounds can sometimes elicit information about the unknown term. For information about compounds, see Appendix D.

ABBREVIATIONS

Sometimes abbreviations may not be comprehended even though the words they represent are in the individual's vocabulary. Knowledge of abbreviations are basically graphical, although some are converted into spoken form. A few abbreviations may have originated in speech, but they are also found in writing (e.g., exam from examination, vet from veteran or veterinarian); these are most commonly called clipped words. Most abbreviations may be formed in one of three basic ways:

1. by keeping only the first letter (e.g., p. for page);
2. by keeping the first two or more letters (e.g., mi. from mile, Jan. from January);

3. by keeping the first letter (sometimes two or more) and the last letter (e.g., hr. from hour, govt. from government).

A few abbreviations are formed by keeping several letters from various places in the word (e.g., frwy. from freeway, sgt. from sergeant). A very few abbreviations use letters not found in the whole word (e.g., oz. from ounce, lb. from pound). Most abbreviations are followed by a period, providing information that the term is a shortened form of another word.

POSSESSIVES

A clue that a term may imply ownership can be deduced from the 's or ' suffix that is added to a noun to indicate possession.

CONTRACTIONS

Contractions, like abbreviations, are shortened forms of words that may be familiar to students if the components can be determined. A contraction is the shortening of the pronunciation of a word created by omitting sounds. Written contractions are based on spoken contractions, with an apostrophe replacing the letters that spell the missing sounds. The contracted word is generally written as one word with the word preceding it (e.g., is becomes 's with that to form that's), although a very few contractions are not written with other words (e.g., ma'am, from madam).

The most common contractions are n't (from not) and auxiliary verbs ('s from is, 'm from am, 're from are, 'll from will, 've from have, 'd from had or--less frequently--from would).

APPENDIX C

ROOTS, AFFIXES, AND AFFIXATION PROCESSES

PREFIXES

Many prefixes have meanings that are relatively predictable. Knowing the prefix's meaning may clarify an unfamiliar term. That knowledge will also enable students to generate new words; e.g., when students know the meaning of the prefix re-, they are able to create many new words with that prefix. Examples of predictable prefixes are noted below:

Prefix	Approximate meaning	Example
a-	"-ing" or "on"	afloat
re-	"again" or "back"	rewrite
un-	"not"	unneeded
mis-	"badly" or "wrongly"	misspell
dis-	"not"	dishonest
en-	"cause to (be)"	enable
in-	"in" or "not"	insane
sub-	"under"	submarine

Some prefixes have more than one meaning. The meanings of still other prefixes are less clear than the meanings for those noted above. Instruction for prefixes such as these should not be eliminated from a vocabulary development program if they are productive. They require what Thorndike (1941) refers to as "teaching probabilities rather than certainties and having students think in terms of variables as well as constants" (p. 73).

SUFFIXES

Some suffixes provide clear and predictable meanings that facilitate both encoding and decoding words. For example, -est means "the most" (e.g., greenest), while -er may mean either "more" (e.g., softer) or "a person who" (e.g., writer). Additionally, many suffixes are helpful in vocabulary decoding because they indicate part of speech; e.g., -ment and -ness are nominal suffixes, while -ful and -less are adjectival suffixes.

ROOTS

Studying the meaning of high-frequency roots aids vocabulary development: Knowing the meaning of the root dict ("say" or "tell") facilitates comprehension and production of words like diction, edict, predict, dictaphone, dictionary, dictator, dictation. Recognizing a root within a word with multiple affixes facilitates sorting out the parts of the word for individual analysis (e.g., unpredictability = the root dict and the prefixes un- and pre-, with the suffixes -able and -ity).

AFFIXATION PROCESSES

Sometimes the meaning of a prefix, suffix, or root is obscured because the phonemic and graphemic changes that concur with affixation disguise the familiar morphemes. Knowledge of these processes enables students to recognize familiar word parts in their altered forms and to produce affixed words themselves. Common affixation processes are consonant doubling, e-dropping, y changing to i, assimilation, and other pronunciation changes.

Consonant doubling occurs before a vowel-beginning suffix, such as -ish or -en, when the preceding syllable is stressed and has a single vowel followed by a single consonant (e.g., red-reddish, forgot-forgotten).

When a word ends with e, that e is dropped before adding a suffix that begins with a vowel (e.g., immune-immunity).

When final y is not part of a two-letter vowel as it is in stay and prey, y is changed to i before adding a suffix that begins with a letter other than i (e.g., fly-flies, but flying).

Before certain consonants, the last sound and letter in some prefixes assimilates to the first consonant of the root word. For example, n in the prefixes en-, in-, and con- changes to m before p, b, and m (e.g., employ, import, combine, commune); to l before l (e.g., collect); to r before r (e.g., irregular). Prefixes such as sub-, ob-, and ad- conform to other assimilation rules.

Affixation may precipitate pronunciation change. One change occurs when the stress in a root word is transferred to another syllable in the suffixed form (e.g., oppose-opposition). Pronunciation change occurs in some words through palatalization when an affix is added. For example, final /t/ becomes /š/ before some vowel-beginning suffixes (e.g., omit-omission). A third kind of pronunciation change occurs as a result of spirantization. For example, final /t/ or /k/ becomes /s/ before some vowel-beginning suffixes (e.g., democrat-democracy, critic-criticism).

APPENDIX D

ALTERNATIVE LANGUAGE

SYNONYMOUS LANGUAGE

Synonyms, antonyms, and terms of specificity

Alternative words that have the same or quite similar meaning are synonyms. While some synonyms are simply alternate expressions for the same meaning, these alternates may have different connotations. However, synonyms for supraordinate class terms are really more specific differentiating terms for members of that class. For example, dog is a classification term. Some alternative words for dog (e.g., puppy, mutt, hound) are connotative synonyms (see connotative language below); however, other "synonyms" are subordinate terms that differentiate within the supraordinate classification of dog: poodle, spaniel, shepherd.

AFFECTIVE LANGUAGE

Connotative language

Connotation refers to the affective implications of a word beyond its denotative meaning. The word house is relatively free of connotations. The word home has the same denotative meaning, but it generally connotes warmth, safety, love, family.

Example

1. dog: bitch, canine, cur, hound, mongrel, puppy, mutt
   [The denotative term is dog. The other words have connotations, although they all denote dog.]

Imagery

Connotative terms stimulate direct emotional responses. Images cause sensory responses which then evoke emotional responses drawn from

the reader's experience. Imagery consists of concrete, frequently colorful words that relate to the five senses. Reference to a rose might evoke a visual image of a rose and an olfactory image of its fragrance. These images might then be associated with the summer days when roses bloom and thus with the reader's affective experience with summer days.

Since images relate to the five senses, they are labeled visual, auditory, tactile, gustatory, and olfactory imagery.

Examples

1. Visual: droop-headed flowers

2. Visual: her hair, soft-lifted by the wind...

3. Auditory: Fully grown lambs bleat loudly from the hill.

4. Auditory and tactile:
   Soft purrs the pussy-cat
   On her little fluffy mat
   And beside her nestles close
   her furry child.

5. Visual and tactile:
   Something there
   White and square
   Sealed with wax, and bumpy
   At the edges flat and thin,
   In the middle lumpy.

6. Gustatory:
   Dreaming of honeycombs to share
   Sweet and chewy
   Sweeter and richer than a pear.

7. Olfactory: drunk with the fumes of roses

Euphemisms

Euphemisms are inoffensive words or phrases that substitute for upsetting words. A euphemism is an indirect way of saying something for which the direct word seems too harsh.

Euphemisms are common in English for body functions, sex, and death. They range from sentimental and poetic expressions to slang and flippant expressions. Euphemisms for death comprise the only category easily included for instruction.

Examples

1. The lamp of light flickered out.
2. She passed to her reward.

Sexist language

Sexism refers to discrimination and its concomitant stereotyping of males and females on the basis of gender. Language that reflects this stereotyping should be restructured to eliminate the sexism. Sexist language includes such dimensions as aggressive/passive expressions and language characteristically used in traditional role playing. However, vocabulary development instruction on sexism is limited in this design to sexist language that "manifests" sexism by the absence of feminine generic terms--language that ignores women and girls (1) through the use of man for humankind, (2) through the use of the pronoun he as the referent for singular pronouns of indeterminate or mixed sex, and (3) through the use of compounds with male component words when the compound may refer to either sex (e.g., congressmen, brotherhood).

Examples

1. Sexist language: Everyone closed his book and went home.
   Alternative: The students closed their books and went home.
2. Sexist language: Man is born free.
   Alternative: People are born free.

3. Sexist language: mailman

   Alternative: mail carrier

FIGURATIVE LANGUAGE

Hyperbole

Hyperbole is overstatement. This figure of speech is not used to deceive, but to emphasize, to intensify an impression.

Hyperbole may be merely a word of broader or more intense meaning than is literally accurate, like perfect for excellent, or it may involve a more complex statement extending through several sentences or an entire passage.

Examples

1. I am starved. [The person is merely hungry.]
2. It's raining cats and dogs. [It's raining hard.]
3. But the feelings that Beethoven put into his music were the feelings of a god. There was something Olympian in his snarls and rages, and there was a touch of hell-fire in his mirth.

Personification

Personification is a figure of speech which endows non-humans with exclusively human attributes (e.g., forms, personality characteristics, behavior, feelings).

Examples

1. a foster child of silence and slow time
2. The villain Envy tricked him into that wrong decision.
3. The computer had a nervous breakdown.
4. Machines grow old and have to be retired.

5. The evening had laid its blanket on the city.

6. The odd thing about truth is that it keeps changing its clothes.

Oxymoron

Oxymoron consists of two contradictory terms, such as "wise fool," that are brought together to create either a new descriptive meaning or an arresting emphasis. Some oxymorons have become so familiar that they are no longer interesting and do not seem contradictory; an example is the expression "terribly pleased."

Examples

1. The eloquent silence overwhelmed him.

2. Love is such painful pleasure.

3. Love's bitter sweetness sometimes has an aftertaste.

Synecdoche and metonymy

Synecdoche and metonymy are two closely related figures of speech which substitute something that is closely associated with an object or living being for the name of that object or being itself. Specifically, synecdoche gives the name of a part when the whole is meant (a sail [for boat] is in the offing) or of a whole for a part (the army [for the administrative personnel] adopts a policy). A good synecdoche must be based on an important part/whole substitution, such as the wheels rather than the radiator when referring to an automobile.

Metonymy is the use of one word for another that it suggests, such as (a) the material for the object made of it, (b) the maker or source for the thing made, (c) any word or phrase closely associated with the object.

Examples of synecdoche

1. There are so many mouths to feed.
2. The plant employs sixty hands.
3. The club called a meeting of the members.

Examples of metonymy

1. "rubbers" for footgear made of rubber
2. "Shakespeare" for Shakespeare's plays
3. "Beethoven" for his music
4. "grandstand" for the audience
5. "the crown" for the king

Simile

A simile is a stated comparison between two essentially unlike entities that are strikingly alike in some one way. The one similarity of the two incongruous entities causes the reader to perceive the comparison as startling or poetic. Similes begin with the words like or as. Occasionally than is the signal word.

Examples

1. The thunder sounded like the roll of bass drums.
2. The piano keys sound as soft as raindrops touching the sidewalk.
3. His eyes were darker than a moonless night.
4. The little sports car lurched forward like an angry dog starting out to catch a cat.
5. The speaker's voice droned on like the incessant humming of a bee.

Metaphor

Whereas simile is a stated comparison, metaphor is an implied comparison between two unlike things that have one feature in common. Three types of metaphors can be used: simple metaphors with a linking verb (example one), noun metaphors that assume a characteristic of one of the two entities being compared (example two), and verb metaphors that assume a characteristic of one of the entities being compared (example three). Examples two and three are so common that they are seldom perceived as metaphorical.

Examples

1. His eyes were fiery coals.
2. The leg of the table is broken.
3. The crowd thundered its applause.

Analogy

An analogy compares two unlike things for several points of similarity. Analogies are sometimes referred to as extended metaphors. They compare the abstract (or less familiar) with the familiar and concrete.

Example

> A political party is an army; it is vast and complex. It has battles to wage, and it will be held responsible for the outcome. Would a wise general share his command? This would allow him to be frequently overruled. An army led in this way would be easily defeated. As in an army, the political party must keep its leadership and chain of command.

Idiomatic language

Idioms are two (or more) words that, when used together, have different definitions from their individual definitions. Some meaning may be derived from the meaning of each component word, but not complete meaning. An extreme example is kick the bucket (meaning "to die"), which entails neither foot movement nor a pail. In a few cases, one part of an idiom may have no meaning by itself, as the fro in to and fro. Such extreme forms of idioms are rare and generally are not significant in vocabulary development. However, two common categories of idiomatic language, compounds and two-word verbs, are important forms of alternative language.

1. Two-word verbs. A two-word verb idiom is composed of a verb and a preposition. Differences in meaning distinguish such forms from verbs followed either by prepositional phrases or by adverbs homographic with prepositions. For example, the literal meaning of look up is to raise the eyes upward (look up from a book, look up at the bird in the tree). However, as a two-word verb it may mean "search for" (look up the word), "call" (look up a friend), or "improve" (business is looking up). Such two-word verbs are common in English and are a major source of new vocabulary.
2. Compounds. Idiomatic compounds are two-word nouns of various compositions: two nouns (e.g., arrowhead); an adjective and a noun (e.g., redcoat); a verb and a noun (e.g., popcorn); a verb and a preposition/adverb (e.g., feedback, output). A few less frequent combinations occur.

Compounds are generally distinguished in speech by their stress pattern: The first word has primary stress; the second word has secondary stress. In writing, compounds may be single words (e.g., greenhouse), hyphenated words (e.g., drive-in), or two separate words (e.g., White House).

In idiomatic compounds, the meaning is indirect; e.g., while a greenhouse is neither green nor a house (i.e., a place where people live), it is a building where plants (which are green) live. In other idiomatic compounds, additional figurative language is involved; a redcoat is a person, not a coat and not a person who is red in color. This compound is really a case of synecdoche.

CONFUSING LANGUAGE

Multiple meaning

Many words have more than one definition. These words may be confusing when the meaning intended by the writer is not the meaning that is decoded by the reader (e.g., Did you bring the kid?, when kid could refer to a child or a goat). Such errors are particularly frequent when one definition is much more familiar than the one intended by the writer.

Homophones

Homophones are words that sound the same, but have different meanings and different spellings, such as meat and meet, slay and sleigh. Homophones cause perceptual confusion in oral language. For this

reason, homophones are a source of puns. Context provides the clue to the correct homophone.

Homographs

Homographs are words that have the same spelling, but different pronunciation and different meaning, such as lead: /lid/ and /led/ and does: /dəz/ and /doz/.

Adjectives and adverbs of relativity

Adjectives and adverbs may be confusing when their meaning varies according to the word they describe. The variance in meaning of these adjectives and adverbs of relativity is one of degree. For example, tall has a different relative meaning in tall building from its meaning in tall person.

Visually confusing words

Some words that are neither homophones nor homographs have confusing visual and/or oral representations. Examples include dessert/desert (noun) and accent/ascent/assent. This confusion often results in malaprops. Recognizing these word pairs or sets and being familiar with the definition of each individual word will preclude this confusion.

Language that varies with time and space

Words do not exist in a vacuum; their meanings depend on the particular users of the language. Language users--and thus the words they use--may differ etymologically across time and dialectically in space. This variation produces language that is frequently confusing.

This alternative language is less important for production than it is for reception--recognizing the meanings of words as used in different times and in different places.

1. Historical change. The meanings of words often change over time. Some words drop out of use, especially if they refer to obsolete objects or concepts. Knowledge of this meaning change is especially important for reading older literature.

   Examples

   1. meat and drink (meat once meant "food")
   2. mice and other small deer (deer once meant "animal")
   3. one-horse open shay (a shay was a kind of carriage)

2. Regional dialect differences. Speakers in various regions of the English-speaking world may use different words for the same concepts. A writer or speaker of one dialect may confuse the reader or listener of another dialect, for comprehension depends on recognizing and interpreting the other dialect.

   Examples

   1. lift (British for "elevator")
   2. swagman (Australian for "vagrant")
   3. roasting ear (southern U.S. dialect for "sweet corn")

APPENDIX E

SUBJECT-AREA VOCABULARY

MATH

1. General terms; e.g., approximation, quotient
2. Terms pertaining to measurement; e.g., calorie, watt
3. Geometric terms; e.g., angle, diagonal
4. Mathematical symbols and abbreviations; e.g., braces, oz.
5. Tools of mathematics; e.g., graph, flowchart

SCIENCE

1. General terms that apply to two or more sub-areas; e.g., fibrous, farenheit
2. Terms from biology and physiology; e.g., flipper, larnyx
3. Terms from botony; e.g., pollen, flora
4. Terms from geology; e.g., fossil, limestone
5. Terms from chemistry; e.g., cell wall, bacillus
6. Terms from physics, meteorology, and astonomy; e.g., telescope, asteriod

ART

1. Color terms; e.g., pastel, brilliant
2. Terms pertaining to form; e.g., asymetry, contour
3. Terms pertaining to medium; e.g., batik, linoleum
4. Terms pertaining to technique; e.g., coat, glaze
5. Tools of art; e.g., cast, dowel
6. Terms pertaining to style; e.g., bold, composition

7. Terms pertaining to art criticism; e.g., communicate, creative

MUSIC

1. General terms; e.g., harmony, minor
2. Terms pertaining to rhythm, e.g., tempo, meter
3. Terms pertaining to instruments; e.g., cymbal, percussion
4. Terms pertaining to form; e.g., toccata, waltz
5. Musical symbols; e.g., clef sign, sharp
6. Terms pertaining to performance; e.g., legato, vibrato
7. Terms pertaining to groups; e.g., choir, orchestra

SOCIAL SCIENCE

1. General terms for two or more sub-areas; e.g., sanction, interact
2. Terms with multiple meanings across sub-areas of social science; e.g., landmark, capital
3. Tools of social science; e.g., profile map, compass
4. Terms from economics; e.g., consumer, productivity
5. Terms from anthropology and sociology; e.g., culture, value conflict
6. Terms from geography; e.g., marsh, plateau
7. Terms pertaining to government; e.g., amend, ambassador
8. Terms from history; e.g., astronaut, settler

COMMUNICATION SKILLS

1. General terms applicable to three or more sub-areas of communication skills; e.g., syllable, homonym
2. Terms pertaining to grammar; e.g., auxiliary, determiner
3. Terms from literature and composition; e.g., limerick, plot

REFERENCES

Anderson, R. C. How to construct achievement tests to assess comprehension. Review of Educational Research, 1972, 42, 145-170.

Anderson, R. C. and Kulhavy, R. W. Learning concepts from definitions. American Educational Research Journal, 1972, 9, 385-390.

Ayers, D. M. English words from Latin and Greek elements. Tucson, Arizona: University of Arizona Press, 1965.

Block, K. Vocabulary development: a problem in learning and instruction. (Draft) 1976, Learning Research and Development Center, University of Pittsburgh, Pittsburgh, Pennsylvania.

Carroll, J. B. Words, meanings, and concepts. Harvard Educational Review, 1964, 34, 178-202.

Clark, C. D. Teaching concepts in the classroom: a set of teaching prescriptions derived from experimental research. Journal of Educational Psychology, 1971, 62, 253-278.

Conference of Reading Studies 1: Semantics, concepts, and culture. Washington, D. C.: National Institute of Education, 1975.

Cronbach, L. J. An analysis of techniques for diagnostic vocabulary testing. Journal of Educational Research, 1942, 36, 206-217.

Deighton, L. C. Vocabulary development in the classroom. New York: Bureau of Publications, Teachers College, Columbia University, 1959.

Draper, A. G. and Moeller, G. H. We think with words (therefore, to improve thinking, teach vocabulary). Phi Delta Kappan, 1971, 52, 482-484.

Dunkel, H. B. Testing the precise use of words. College English, 1944, 5, 386-389.

Gray, W. S. and Holmes, E. The development of meaning vocabularies, 1938. (Referenced in Petty, et al., 1967.)

Humes, A. Requirements for vocabulary development instruction. Technical Note No. 3-76-08, 1976, SWRL Educational Research and Development, Los Alamitos, CA.

Johnson, D. M. and Stratton, R. P. Evaluation of five methods of teaching concepts. Journal of Educational Psychology, 1966, 57, 48-53.

Khan, S. B. Learning and the development of verbal ability. American Educational Research Journal, 1972, 9, 607-614.

Klausmeier, H. J., Ghatala, E. S., and Frayer, D. A. Conceptual learning and development: A cognitive view. New York: Academic Press, Inc., 1974.

Markle, S. M. They teach concepts, don't they? Educational Researcher, 1975, 6, 3-9.

Mayer, R. E. and Greeno, J. G. Structural differences between learning outcomes produced by different instructional methods. Journal of Educational Psychology, 1972, 63, 165-173.

Morrison, B. S. One route to improved reading comprehension: A look at word meaning skills. Paper presented at IRA Convention, Anaheim, California, May, 1976.

O'Rourke, J. P. Toward a science of vocabulary development. Paris: Mouton Press, 1974.

Petty, W. T., Herold, C. P., and Stoll, E. NCTE Committee on the state of knowledge about the teaching of vocabulary, final report. Champaign, Illinois: National Council of Teachers of English, 1967.

Quealy, R. J. Senior high school students use of contextual aids in reading. Reading Research Quarterly, 1969, 4, 512-533.

Rhode, M. and Cronnell, B. Development of the communication skills lexicon coded with linguistic information. Technical Report (forthcoming), SWRL Educational Research and Development, Los Alamitos, CA.

Russell, D. H. The dimensions of children's meaning vocabularies in grades four through twelve. University of California Publications in Education, II. Berkeley: University of California Press, 1954.

Thorndike, E. L. The teaching of English suffixes. New York: Bureau of Publications, Teachers College, Columbia University, 1941.